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(71) Applicant (for all designated States except US): CY-TOKINETICS, INC. [US/US]; 280 East Grand Avenue, South San Francisco, CA 94080 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): KUTSYY, Vadim [US/US]; 553 Tyndall Street, Los Altos, CA 94022 (US). VAISBERG, Eugeni, A. [US/US]; 647 Pegasus Lane, Foster City, CA 94404 (US). COLEMAN, Daniel, A. [US/US]; 328 West 36th Avenue, San Mateo, CA 94403 (US).

(74) Agent: GARRETT, Arthur, S.; Finnegan, Henderson, Farabow, Garrett & Dunner LLP, 1300 I Street, N.W., Washington, District of Columbia 20005-3315 (US).

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(54) Title: METHODS AND APPARATUS FOR INVESTIGATING SIDE EFFECTS

(57) **Abstract:** Methods, apparatus, and computer programs for investigating and characterising side effects of a treatment having an intended or on-target effect on cells are described. The method can include identifying a group of on-target cellular features of the plurality of cells which are affected by the treatment and are related to the on-target effect. A group of off-target cellular features can also be identified which are different to the on-target cellular features and which are also affected by the treatment and which are related to the side effect. A measure of the side effect based on the off-target cellular features can be obtained. The treatment can then be characterised based on the measure of the side effect. A further method involves capturing an image of the population of treated cells and deriving cellular features from the image. An on-target effect signature, which is characteristic of the on-target effect is created from cellular features relating to cellular properties involved in the intended effect. A side effect signature, which is characteristic of a side effect to the on-target effect, is created using cellular features relating to cellular properties not involved in the intended effect. On target effect and/or side effect metrics are obtained from the signatures which can be used to characterise the treatment.